(p. 343), we learn also from Mr. W. Hill that “ As a whole the amorphous material of the Upper Chalk appears to be made up almost entirely of the débris of calcareous organisms.”

UNIVERSITY AND EDUCATIONAL INTELLIGENCE.

Dr. Harold A. Wilson has been elected senior lecturer in physics at King's College, London, and Mr. S. C. Laws junior lecturer.

On July 27 Sir Thomas H. Elliott, K.C.B., Secretary to the Board of Agriculture, will open the extensions of the Midland Agricultural and Dairy Institute at Kingston-on-Soar.

Prof. Chantemesse has, at his own request, been transferred to the chair of hygiene at the University of Paris, vacant through the death of Prof. Proust. The chair of experimental pathology thus vacated has been filled by the appointment of Dr. Roger to succeed Prof. Chantemesse.

We learn from *Science* that Mrs. Henry Whitman, of Boston, has made public bequests amounting to more than 40,000*l*., including 22,000*l*. to Radcliffe College and 2000*l*. to Harvard University; and that Mr. George Ehret, of New York, has given 2000*l*. to the permanent fund of Hamilton College.

Mr. H. A. Clark, late assistant lecturer in engineering at the University of Leeds, has been appointed head of the engineering department of the Northern Polytechnic Institute, London. Mr. Clark was Ramsbottom scholar at Owens College, Manchester, a Whitworth scholar, and is an associate of the Royal College of Science.

The first annual report of the University Extension Guild has now been published. The object of the association, which was founded last December, is “ to promote among all classes, at times convenient to all, the extension of university teaching.” The report states that the work accomplished and the influence exerted by the guild have been considerable, and give great hopes of success in the future. The honorary secretary of the guild is Mr. Max Judge, 7 Pall Mall, S.W.

The Montgomery County Council recently discussed a resolution, passed at the Swansea conference of county council delegates, recommending to county councils the establishment of schools of forestry, and the giving of grants to existing colleges. The chairman said all are agreed that planting is a very desirable agricultural improvement, and that the management of woods in many cases leaves much to be desired. It would be, he continued, for the advantage of the country if the council provided forestry instruction in addition to the instruction they had provided in other branches of rural pursuits, and at his suggestion delegates were appointed by the council to attend a conference to be held for the purpose of discussing the question.

The Prince of Wales, who was accompanied by the Princess of Wales, on July 16 laid the foundation-stone of the new buildings of the Working Men's College, which was founded by F. D. Maurice. The plans of the new buildings show a hall to accommodate 250 persons, common rooms, club rooms, and gymnasium for the students, a library fitted for 10,000 books, and a museum. There are added electrical and chemical laboratories, with which the old college was not equipped. Altogether there is teaching space provided for 700 students. Replying to an address—read by the principal of the college, Prof. A. V. Dicey—the Prince of Wales expressed his cordial sympathy with the aims and objects of the college, which are to bring within reach of the working classes the means of knowledge and culture. As the Prince of Wales said later, “ the Working Men's College has seen its aims fulfilled and its pioneer work taken up and extended by those numerous and great institutions for commercial and technical instruction which have been established in the capital and in all parts of the Empire.”

The importance of establishing a national school of forestry was recently urged by the Association of Chambers of Commerce. The following reply has been sent to the association by Sir Thomas Elliott, on behalf of the Board of Agriculture:—“ The President of the Board of Agriculture and Fisheries fully recognises the importance which attaches to the question of afforestation and to the provision of a national system of instruction in forestry. Steps have already been taken in more than one direction to give effect to the recommendations of the departmental committee which was appointed in 1902, under the chairmanship of Mr. R. C. Munro Ferguson, M.P., to inquire into the subject. Through the agency of the Commissioners of Woods and Forests a school of forestry has been established in the Forest of Dean, and a movement is on foot for securing a suitable area of land in Scotland for the purpose of demonstrating scientific forestry. The Board has taken steps to secure the establishment of at least two lectureships in forestry in England, and some of the leading universities and agricultural colleges have been giving attention to proposals under this head. The agricultural departments of the University College of North Wales, Bangor, and of the Durham College of Science, Newcastle-upon-Tyne, appeared to offer special advantages as centres of instruction in forestry, and grants in aid of the establishment of schemes of education in the subject will be made by the Board to those institutions. The Board hopes that the arrangements thus made will result in a considerable improvement of the facilities available in this country for the acquirement of a knowledge of practical forestry.”

The following are among the awards of Carnegie research fellowships, scholarships, and grants for the academic year 1904–5, under the Carnegie trust, for the universities of Scotland:—Fellowships.—*Physical,* D. B. McQuistan; *Chemical,* C. E. Fawsitt, Dr. J. C. Irvine, W. Maitland; *Biological,* J. Cameron, Dr. F. H. A. Marshall, H. J. Watt; *Pathological,* C. H. Browning, J. C. G. Ledingham, S. A. K. Wilson. Scholarships.—*Physical,* P. D. Innes, H. W. Malcolm, J. H. Maclagan Wedderburn, J. R. Milne; *Chemical,* Adam Cameron, W. A. K. Christie, F. W. Gray, J. Johnston, F. J. Wilson, J. Wood; *Biological,* Margaret T. Hamilton, W. D. Henderson; *Agricultural,* S. F. Ashby, C. Carter; *Physiological,* J. S. Rose; *Pathological,* C. M. Campbell, R. D. Keith, W. G. Rodger. Grants.—*Physical,* G. A. Carse, Prof. MacGregor, T. Oliver, W. Peddie; *Chemical,* Prof. G. G. Henderson and Dr. Gray, Dr. A. N. Meldrum; *Biological,* Dr. J. H. Ashworth, Dr. J. Beard, Cyril Crossland, Prof. J. Cossar Ewart, Prof. Paterson, Dr. John Rennie, W. G. Smith, Dr. D. Waterston, Dr. J. H. Wilson, Prof. R. Patrick Wright and A. N. M'Alpine; *Anatomical,* E. B. Jamieson; *Pharmacological,* Prof. R. Stockman; *Pathological,* Dr. J. K. Love, E. Bramwell, Prof. Carstairs C. Douglas, A. H. Edwards, Dr. A. Goodall, J. M. Kirkness, Prof. Robert Muir, Peter Paterson, W. B. Inglis Pollock, B. P. Watson, Dr. J. M. Bowie, Dr. James Scott, D. C. Watson. The twenty-four scholarships, twelve fellowships, and thirty-five grants awarded for 1904–5 amount in all to 5300*l*. The amount expended by the trust under this scheme for 1903–4 was 3400*l*.

SOCIETIES AND ACADEMIES.

London.

Royal Society, May 19.—“ On the Liquefied Hydrides of Phosphorus, Sulphur, and the Halogens as Conducting Solvents.” Parts i. and ii. By D. **M'Intosh,** B. D. **Steele,** and E. H. **Archibald.** Communicated by Sir William Ramsay, K.C.B.

In this paper the behaviour of phosphuretted hydrogen, sulphuretted hydrogen, hydrogen chloride, bromide, and iodide as conducting solvents has been investigated, and, in order to try and explain certain abnormalities in the variation of conductivity with concentration of their solutions, the following physical constants have been determined. (1) The vapour pressure curves from which the melting and boiling points are obtained. (2) The densities at various temperatures. (3) The molecular surface energies; from these it is seen that the hydrides of phosphorus and chlorine when liquefied are more or less associated to form complex molecules, whereas the remaining compounds occur as simple molecules. (4) The viscosity temperature coefficient. This was measured in order to compare with

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the temperature coefficient of electrical conductivity. (5) Solubilities and conductivities. A large number of substances were examined, and it was found that many organic compounds containing oxygen or nitrogen dissolved readily in HCl, HBr, HI, and H_2S, and formed solutions which conducted well.

Inorganic substances, on the other hand, did not dissolve, or if so only in the merest traces. An exception to the latter generalisation occurs in the case of H_2S dissolved in HBr; these liquids mix in all proportions, but the mixture does not conduct the current.

June 16.—"On Flame Spectra." By Charles de Watteville. Communicated by Arthur Schuster, F.R.S.

In order to obtain the spectrum of any substance, it has generally been considered sufficient to introduce a small quantity of it into an already formed flame. In the course of a photometrical investigation of flames which had been coloured by injecting the spray from saline solutions into the gas to be burnt, M. Gouy discovered in the spectra of the flames several new lines belonging to the metal contained in the solution (*Annales de Chimie et de Physique,* 5th series, vol. xviii., 1879). Instead of appearing throughout the whole flame, as did the previously known lines, these new lines were only emitted in the vicinity of the inner blue cone—the origin of the Swan spectrum.

The method employed by the author is, in short, that which has been introduced by M. Gouy.

The lines in the spectra obtained under the conditions of his experiments are very much more numerous than is the case when all the portions of the flame do not participate in the production of the phenomena. Moreover, the flame spectra extend sufficiently far into the ultra-violet in order to enable the line 2194 of tin to be observed.

The lines which are found in the flame spectrum are those which are the strongest lines in the arc spectrum. In certain cases, some of the more intense arc lines are absent, whereas less intense arc lines are to be found in the flame spectrum. On the other hand, none of the characteristic lines of the spark spectrum are ever seen in the flame spectrum.

There is a most striking similarity between the flame spectra of iron, of nickel, and of cobalt, and the oscillatory spark spectra of the same metals in the region included between about 4300 and 2700 Angström units. The similarity of the two spectra is so great that, except for very small differences of intensity, the oscillatory spark spectrum, which is photographed as a comparison spectrum in the centre of the flame spectrum, appears to be a prolongation of the latter. In the ultra-violet the spectrum of the flame appears to fade away a little more rapidly than that of the oscillatory spark, but it is probable that this difference would be reduced by prolonging the time of exposure, since it is, of course, the radiations of the shortest wave-length which are most absorbed by different media.

It is very probable that the reason for this similarity between the spectrum of the flame and the spectrum of the oscillatory spark is entirely a question of temperature. On the one hand, the increase in the number of lines of the flame spectrum obtained by the use of the sprayer may be attributed to the fact that the hottest regions of the flame take part in the production of the phenomena, and, on the other hand, the diminution in the number of lines in the spark spectrum when the spark becomes oscillatory is due to a diminution of its temperature.

NEW SOUTH WALES.

Royal Society, May 4.—Prof. F. B. Guthrie, president, in the chair.—Prof. F. B. **Guthrie** delivered the presidential address, in which he gave a *résumé* of the condition of chemistry and chemists in the State. Of the teaching institutions, the university made ample provision for teaching chemistry; about 300 students were in attendance at lectures, and about 150 doing practical work in the laboratories. In conclusion, stress was laid upon the necessity for centralising chemical research work. At present there existed the opposite tendency—to decentralise it as the departmental work grew. Personally, he would like to see established a central scientific institute, where all the scientific work could be conducted. Failing this, a great deal could be done in consolidating scientific work and increasing its efficiency by the creation of a controlling science department, which would administer the different scientific establishments under departmental control. This would be of great advantage in research, especially where it required the cooperation of more than one branch of science. Investigation into subjects of national importance could then be carried out in continuity.

June 1.—Mr. C. O. Burge, president, in the chair.—Possible relation between sun-spots and volcanic and seismic phenomena and climate: H. I. **Jensen.** This paper is a sequel to the author's note communicated to the Royal Society of New South Wales on June 4, 1902. The paper is divided into two parts. In the first part it is shown that while there has been a marked rise in solar activity since the middle of 1902, seismic and volcanic disturbances have fallen off on the earth, both in violence and frequency, almost to a minimum. In the second part of the paper various sun-spot and meteorological theories are considered. The climates of Australia and Mauritius are discussed, and the occurrence of heavy rains at sea during drought periods, the retreat of glaciers during cold winters, and the diminution in the number of cyclones during sun-spot minima are ascribed to the same cause, namely, the feebler circulation of the atmosphere due to the diminution in the amount of heat received from the sun during sun-spot minima. An index to literature and tables of earthquake and eruption statistics follow.—On the absence of gum, and the presence of a new diglucoside in the kinos of the Eucalypts: H. G. **Smith.** In this paper, which is the first of a series dealing with Eucalyptus kinos, the author shows that the supposed gum occurring in many Eucalyptus kinos is not gum, but a peculiar tannin diglucoside.—On some natural grafts between indigenous trees: J. H. **Maiden.** The author obtained from George's River a composite log which in bark and timber showed the absolute fusion of white or cabbage gum (*Eucalyptus haemastoma,* variety *micrantha*) and stringybark (*Eucalyptus capitellata*). The red timber of the former contrasts well with the pale brown of the latter, and the fusion of the two timbers is perfect. Such instances of the organic union of two species of the same genus have been rarely recorded.

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